BUZZARD POINT FRAMEWORK PLAN TRANSPORTATION STUDY

WASHINGTON, DC

June 15, 2015

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INTRODUCTION

This report presents the findings of a transportation study of Buzzard Point and proposed future development. Buzzard Point, located in Southwest DC along the bank of the Anacostia River, is a peninsula currently dominated by industrial uses. The District is working with DC United to locate a new soccer stadium on several underutilized and unattractive parcels. The establishment of such a visitor attraction offers a catalytic opportunity to spur redevelopment within the area.

To help guide the redevelopment of Buzzard Point, the District Office of Planning assembled the *Buzzard Point Vision Framework + Implementation Plan*. The purpose of the Framework Plan is to identify the future of Buzzard Point and establish expectation for stakeholders.

The purpose of this memorandum is to review the transportation aspects of the Framework Plan, focusing on analyzing the traffic impacts of the potential new development outlined in the plan and developing minimum roadway requirements for Buzzard Point streets.

This report is split into two sections. The first provides a summary of existing major transportation features near and adjacent to the site including reviewing roadways, transit facilities, bicycle facilities, and pedestrian facilities. The purpose of this section is to outline connectivity needs of all modes to and from the study area. This information was used to help develop the roadway recommendations presented in the second section of the report.

The second presents an analysis of weekday traffic operations and provides multi-modal recommendations for the neighborhood. This includes an analysis of potential future demand, comparisons with demand assumed in prior DDOT studies, capacity analysis, and recommendations. The recommendations are based on the technical analysis of internal roadways within the study area, and the review of connectivity to and from the study area presented in the first section.

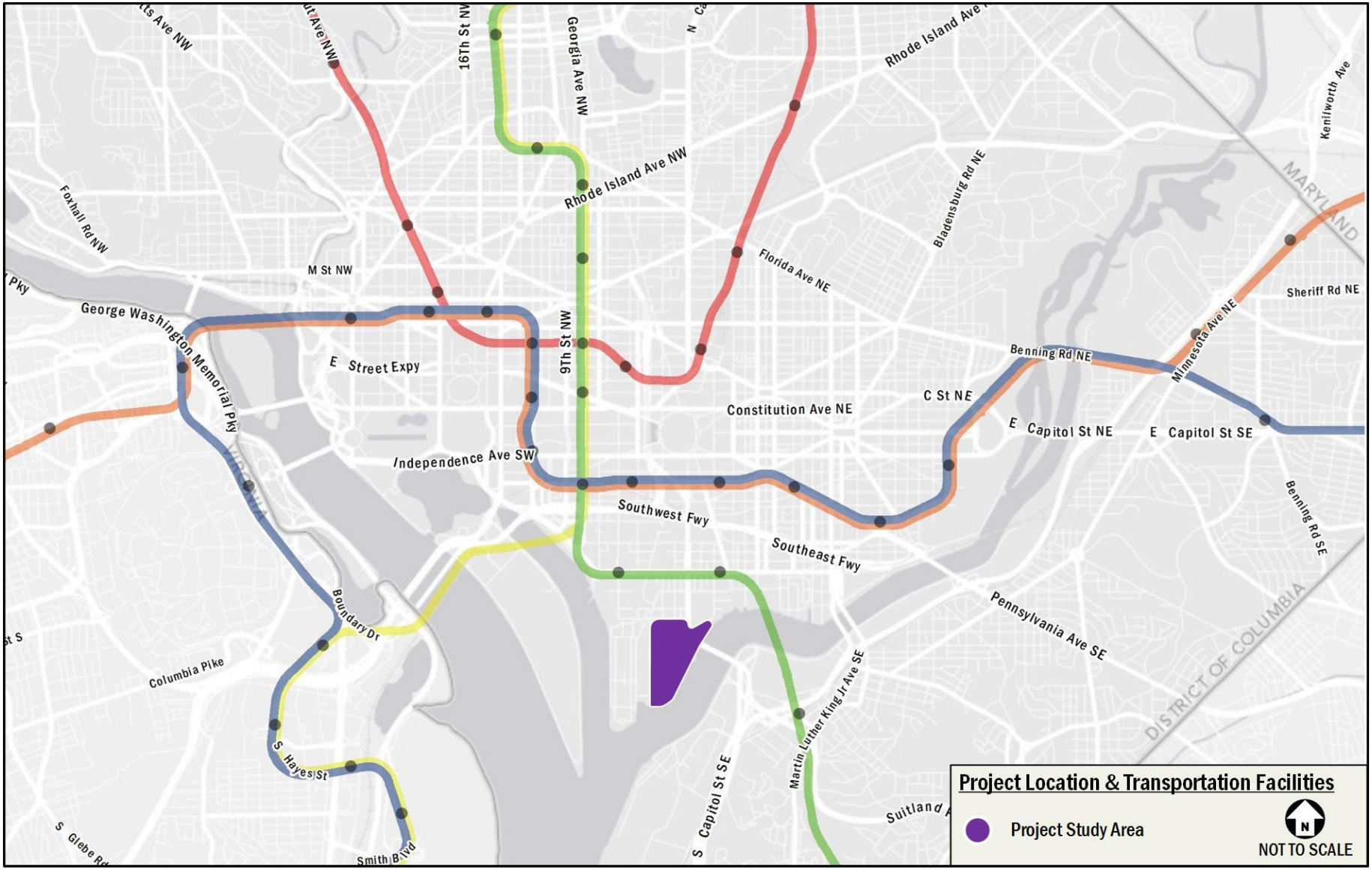

Figure 1: Site Location

EXISTING AND PROPOSED NETWORK

Buzzard Point is located in the Southwest quadrant of Washington, DC and is generally bounded by P Street to the north, South Capitol Street to the east, the Anacostia River to the south, and Fort McNair to the west. The area is served by many regional roadways and arterials including Interstate 395, Interstate 695, Interstate 295, Maine Ave SW, M Street SW/SE, and South Capitol Street.

Figure 1 identifies the project study area within the district. The area is accessible via these roadways, along with a network of collector and local streets.

The area is served by public transportation, including Metrorail and Metrobus service. The area is also served by a pedestrian network consisting of sidewalks and crosswalks along the local streets and surrounding the project site. In addition to pedestrian accommodations, the site is served by a bicycle network, which consists of mixed-use trails and bike lanes.

TRANSIT

The study area is well served by heavy rail, commuter bus, and local bus service. Combined, these transit services provide local, city wide, and regional transit connections and link Buzzard Point with major cultural, residential, employment, and commercial destinations throughout the region. Figure 2 identifies the major transit routes, stations, and stops in the area.

Metrorail and Metrobus services connect the area with other District neighborhoods and the Washington Metropolitan region. The area is primarily serviced by Metrobus along the M Street corridor with some local service within the neighborhood. The routes serving this area connect the site to various locations throughout the District and the downtown

Table 1: Bus Route Information

Route Number	Route Name	Service Hours[1],[2]	Headway[1]
74	Convention Center-Southwest Waterfront Line	Weekdays: 5:03AM – 12:03AM	15 min – 20 min
315	Columbia/Silver Spring to Washington DC	Weekdays: Inbound: 4:36AM – 7:45 AM Outbound: 2:40PM – 7:53PM	20 – 30 min
735	Charlotte Hall/Waldorf to Washington DC	Weekdays: Northbound 4:20AM – 7:00AM Southbound 12:15PM – 5:25PM	20 – 30 min
A9	Martin Luther King Jr. Ave. Limited Line	Weekdays: Northbound 5:55AM – 8:50AM Southbound 3:35PM – 6:52PM	15 min
A42,46,48	Anacostia-Congress Heights Line	Weekdays: 4:00AM – 12:00 AM Weekends: 4:04AM – 12:40 AM	15 – 30 min
D300	Dale City-Washington Navy Yard	Weekdays: Inbound: 4:36AM – 6:43 AM Outbound: 12:13PM – 7:42PM	30 – 90 min
DCN22	Union Station - Navy Yard Circulator	Winter: 6:00AM- 7:00PM Summer: 6:00AM - 9:00PM Sundays: 7:00AM - 9:00PM	5 – 40 min
LCC	Loudoun County to Washington DC	Weekdays: Inbound: 5:00AM – 9:09 AM Outbound: 3:42PM – 5:00PM	25 – 45 min
P6	Anacostia-Eckington Line	Weekdays: 5:05AM – 2:04 AM Weekends: 8:27AM – 11:56 PM	15 – 30 min
P17,P19	Oxon Hill-Fort Washington Line	Weekdays: Northbound 4:47AM – 9:53AM Southbound 2:57PM – 7:10PM	5 – 15 min
V7, V8, V9	Minnesota Avenue-M Street Line	Weekdays: 4:38AM – 2:01 AM	30 min
W9	South Capitol Street Limited Line	Weekdays: Southbound 6:15AM – 9:07AM Northbound 3:15PM – 6:15PM	15 – 30 min
W13	Bock Road Line	Weekdays: Northbound 4:52AM – 9:02AM Southbound 3:35PM – 7:53PM	5 – 15 min

[1] WMATA route schedules, http://wmata.com/bus/timetables/

[2] MTA route schedules http://mta.maryland.gov/commuter-bus

business core. Table 1 shows a summary of the bus route information for the Lines that serve the area's vicinity, including service hours, and headway.

The Waterfront-SEU and Navy Yard Metrorail stations, which serve the Green Line, are in the vicinity of the study area. The Green Line connects the study area with major downtown connections such as Chinatown/Gallery Place, as well as Fort Totten and Greenbelt, Maryland to the north and Branch Avenue station in Maryland to the South. Metrorail trains run approximately every three minutes during the morning and afternoon peak hours. They run about every 5-6 minutes during weekday non-peak hours, every 10-15 minutes on weekday evenings after 7:00 pm and 6-15 minutes on the weekends.

Proposed Transit Service

Due to growth of population, jobs, and retail in several neighborhoods in the District and the potential for growth in other neighborhoods, the District's infrastructure is challenged with the need for transportation investments to support the recent growth and to further strengthen neighborhoods. In order to meet these challenges and capitalize on future opportunities, DDOT has developed a plan to identify transit challenges and opportunities and to recommend investments. This is outlined in the DC's Transit Future System Plan report published by DDOT in April 2010. This plan includes the reestablishment of streetcar service in the District and in the vicinity of the proposed development.

The streetcar system will consist of modern low-floor vehicles that operate on surface tracks embedded in the roadways. Stops will generally be located every ¼- to ½-mile along the routes. The District's streetcar plan includes two planned lines that are expected to terminate in Buzzard Point. The planned routes for these lines will connect Buzzard Point with Takoma/Silver Spring to the north (North-South Corridor) and with Anacostia to the south.

DDOT is currently conducting a study for the North-South Corridor which provides three different route alternatives for Buzzard Point. These routes show two-way streetcar travel along 2nd Street or a one-way loop around Buzzard Point. All route concepts would include construction of a maintenance facility located within the Buzzard Point neighborhood at the terminus of the line. More information regarding the North-South Streetcar Corridor can be found at the following link: http://www.dcstreetcar.com/projects/future-lines/northsouth/.

Since it is currently unknown where streetcar tracks will be installed within Buzzard Point, this study considered all three alternatives when developing recommended cross-sections later in this report. The main concern is separating bicycle facilities from tracks, and developing alternatives for facilities that provide bicycle connectivity for all three streetcar routing options.

Exiting Bicycle Facilities

Within the study area bicycles have access to multi-use trails, on-street bike lanes, signed bike routes, and local and residential streets that facilitate cycling. The bicycle network provides good conditions for local trips and there are several routes for trips between the study area and other areas within the District.

Directly east of the study area is an access point to the Anacostia Riverwalk Trail which travels north-south and connects Anacostia with the National Mall Trails system. Although the trail has some breaks between the two destinations, signed bike routes lead users along safe routes back to the trail. Additionally there are bike lanes that connect the study area in all directions. The 4th Street SW (north and southbound) and Potomac Avenue SE (eastbound) bike lanes provide connectivity to locations around the study area and link cyclists to other bicycle facilities in the District. A map of the existing bicycle facilities in the vicinity of the site is shown in Figure 3.

In addition, the Capital Bikeshare program allows for an additional cycling option. Users can choose to join the program for one day, three days, a month, or a year. Therefore this program is perfect for both visitors and residents of the area. Users can rent a bike from the nearest docking station, ride the bike to their destination, and return the bike to a different docking station, making the system convenient for one-way and two-way trips. The Capital Bikeshare program has placed over 300 bicycle-share stations across Washington, DC, Arlington and Alexandria, VA, and Montgomery County, MD with over 2,500 bicycles provided. There are five stations within a half-mile radius of the northern edge of the study area contributing to a total of 113 docking stations as summarized in Table 2.

Table 2: Bikeshare Locations and Docking Stations

Bikeshare Location	Number of Docking Stations
1st and K St SE	15 docking stations
4th and M St SW	23 docking stations
M St and New Jersey Ave SE	17 docking stations
3rd and Tingey St SE	19 docking stations
1st and N St SE	39 docking stations
Total	**113 docking stations**

Proposed Bicycle Facilities

The MoveDC plan outlines several bicycle improvements in the vicinity of the project area. These improvements are broken up into four tiers that rank the priority for implementation. The four tiers are broken down as follows:

- *Tier 1*
  Investments should be considered as part of DDOT's 6-year TIP and annual work program development, if they are not already included. Some projects may be able to move directly into construction, while others become high priorities for advancement through the Project Development Process.

  One Tier 1 improvement is adjacent to the study area, a cycletrack along 4th and P Streets connecting Maine Avenue, Anacostia Riverwalk Tail, and the future traffic oval. This analysis assumes that a connection will occur along this alignment when recommending bicycle routes within the study area.

- *Tier 2*
  Investments within this tier are not high priorities in the early years of MoveDC implementation. They could begin moving through the Project Development Process if there are compelling reasons for their advancement.

  Included in Tier 2 are bicycle lanes along Potomac Avenue within the study area.

- *Tier 3*
  Investments within this tier are not priorities for DDOT-led advancement in the early years of MoveDC's implementation. They could move forward earlier under circumstances such as real estate development initiatives and non-DDOT partnerships providing the opportunity for non-District-led completion of specific funding.

  Tier 3 improvements adjacent to the study area include bicycle trails alongside South Capitol Street. This analysis did not assume this route is in place when making recommendations for bicycle routes.

- *Tier 4*
  Generally, investments within this tier are not priorities for DDOT-led advancement and are lower priority for project development in the early years of implementation.

  There are no Tier 4 bicycle improvements within or near the study area.

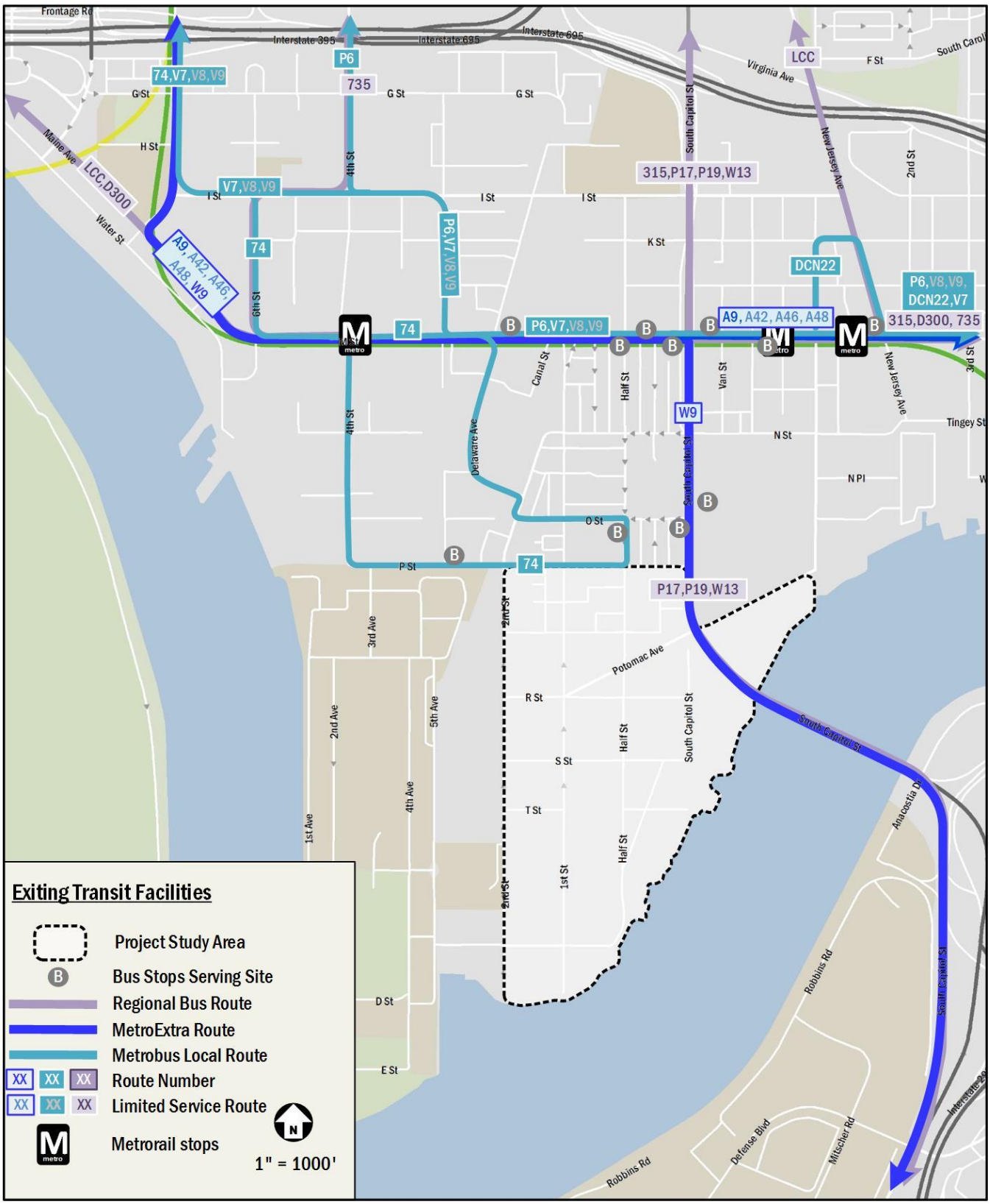

Figure 2: Existing Transit Facilities

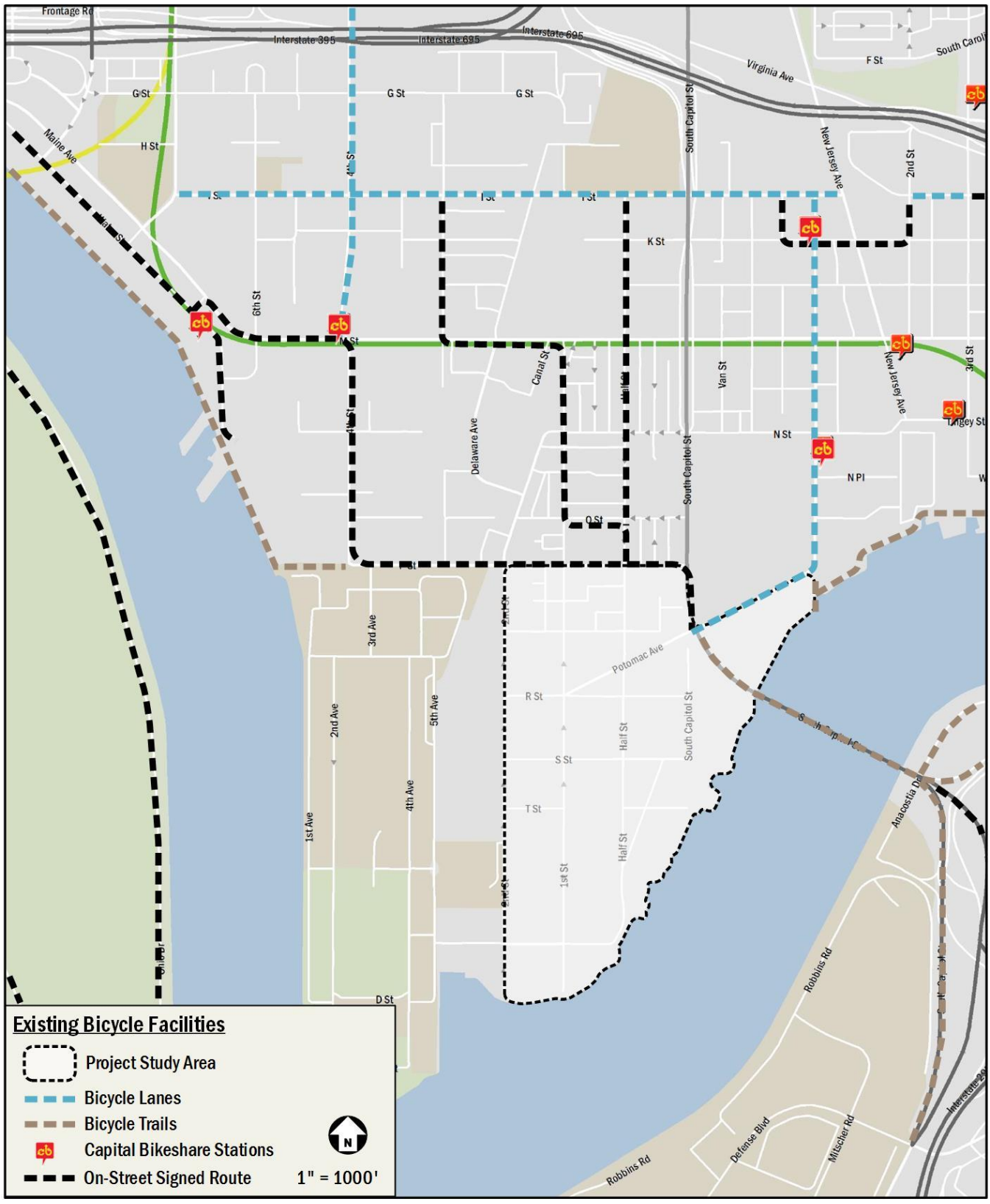

Figure 3: Existing Bicycle Facilities

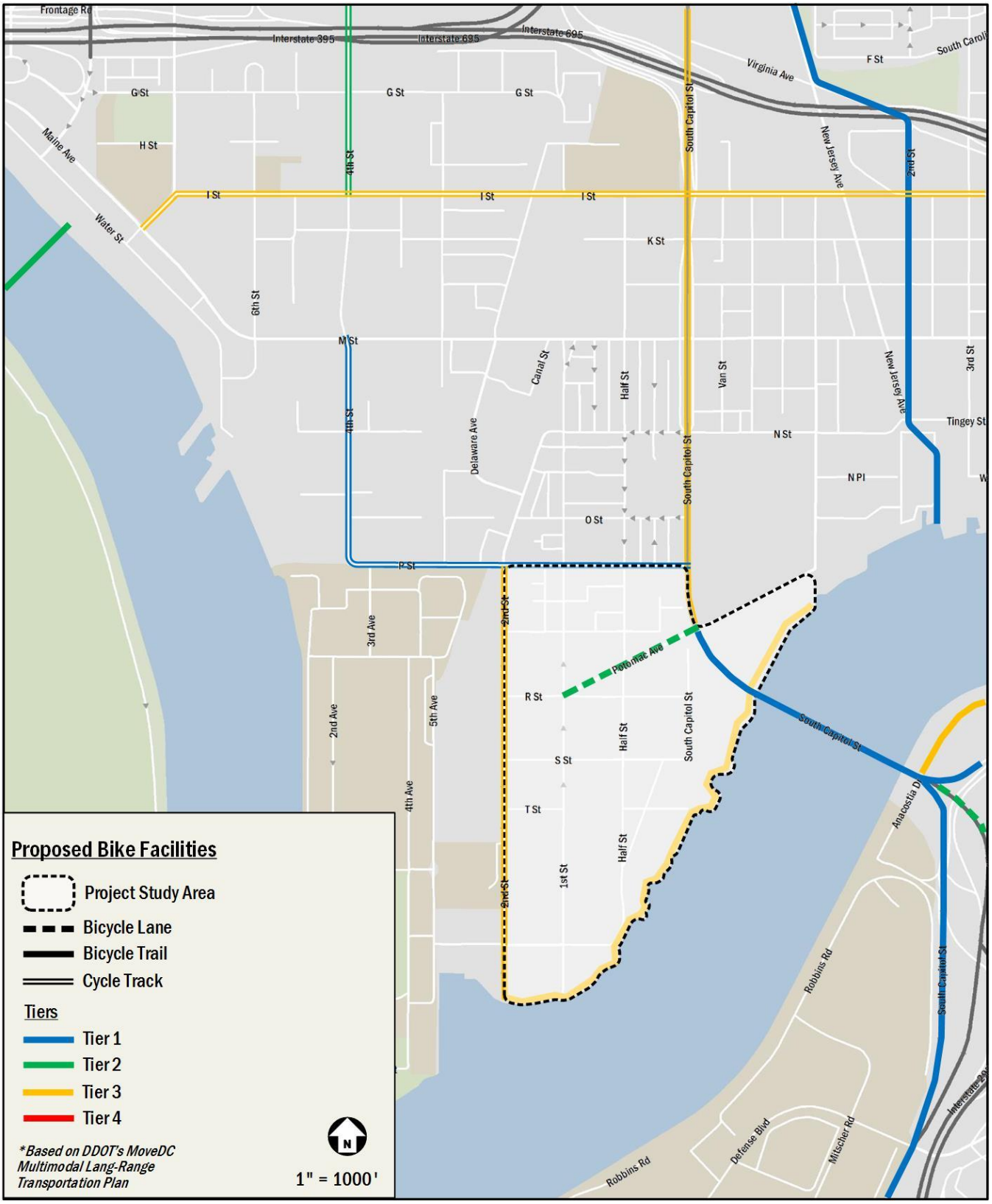

Figure 4: Proposed Bicycle Facilities

PEDESTRIAN FACILITIES

This section provides an inventory of the existing pedestrian access facilities and deficiencies. Overall, the pedestrian facilities within the study area provide a poor walking environment. There is good pedestrian access to the area along most adjacent streets.

The study area has good pedestrian access to nearby transit. The Waterfront-SEU and Navy Yard Metrorail stations are located in the vicinity of the site. The study area is also within walking distance to many bus routes along M Street, South Capitol Street and P Street SE that provide local and commuter service between the study area and additional destinations within the District.

There are a few barriers or areas of concern within the study area that negatively impact the quality and attractiveness of walking, including walking distances between the study area and some major destinations, manmade and natural barriers that increase walking distances, and roadway conditions that reduce the quality of walking conditions, including narrow sidewalks, lengthy freeway overpasses/underpasses, and lengthy crossings at some intersections. These are primarily due to the area's proximity to South Capitol Street and the Anacostia River. Figure 5 illustrates major walking routes and pedestrian barriers in the vicinity of the site.

A detailed review of pedestrian facilities near the study area shows that most facilities inside the study area do not meet DDOT standards, while most outside of the study area provide a quality walking environment. Figure 6 shows a detailed illustration of the existing pedestrian infrastructure within a quarter-mile walkshed of the study area. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by DDOT's Public Realm Design Manual in addition to ADA standards. Sidewalk width and buffer requirements for the District are shown below in Table 2. Within the quarter-mile walkshed, most roads are considered residential with a low to moderate density. The majority of sidewalks comply with an 8 foot sidewalk width and most have a 4 to 6 foot buffer. Even if no buffer exists between the edge of the sidewalk and the roadway, most roadways allow on-street parking which creates an additional buffer between pedestrians and vehicular traffic. ADA standards require that all curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, shared curb ramps between two crosswalks is not desired. As shown in the figure, under existing conditions there are occasional issues regarding curb ramps and for the most part, these issues are due to a lack of detectable warning strips.

The results of the pedestrian facilities review show that within the study area there are significant pedestrian deficiencies that will need to be addressed as redevelopment occurs. The cross-section recommendations made later in this report take this into account, providing sufficient room to meet or exceed DDOT standards.

Table 3: Sidewalk Requirements

Street Type	Minimum Sidewalk Width	Minimum Buffer Width
Residential (Low to Moderate Density)	6 ft	4 ft (6 ft preferred for tree space)
Residential (High Density)	8 ft	4 ft (6 ft preferred for tree space)
Commercial (Non-downtown)	10 ft	4 ft
Downtown	16 ft	6 ft

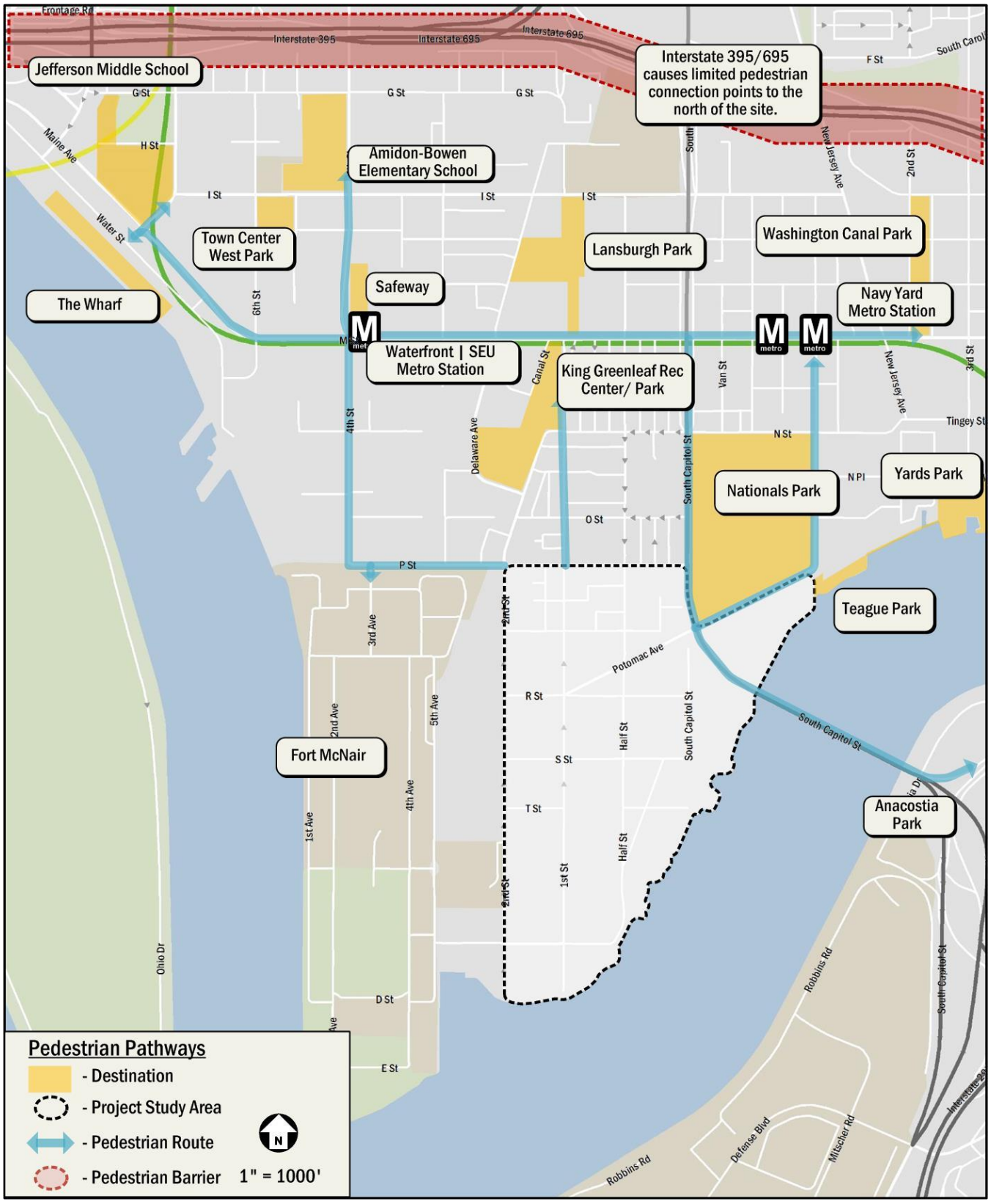

Figure 5: Pedestrian Facilities

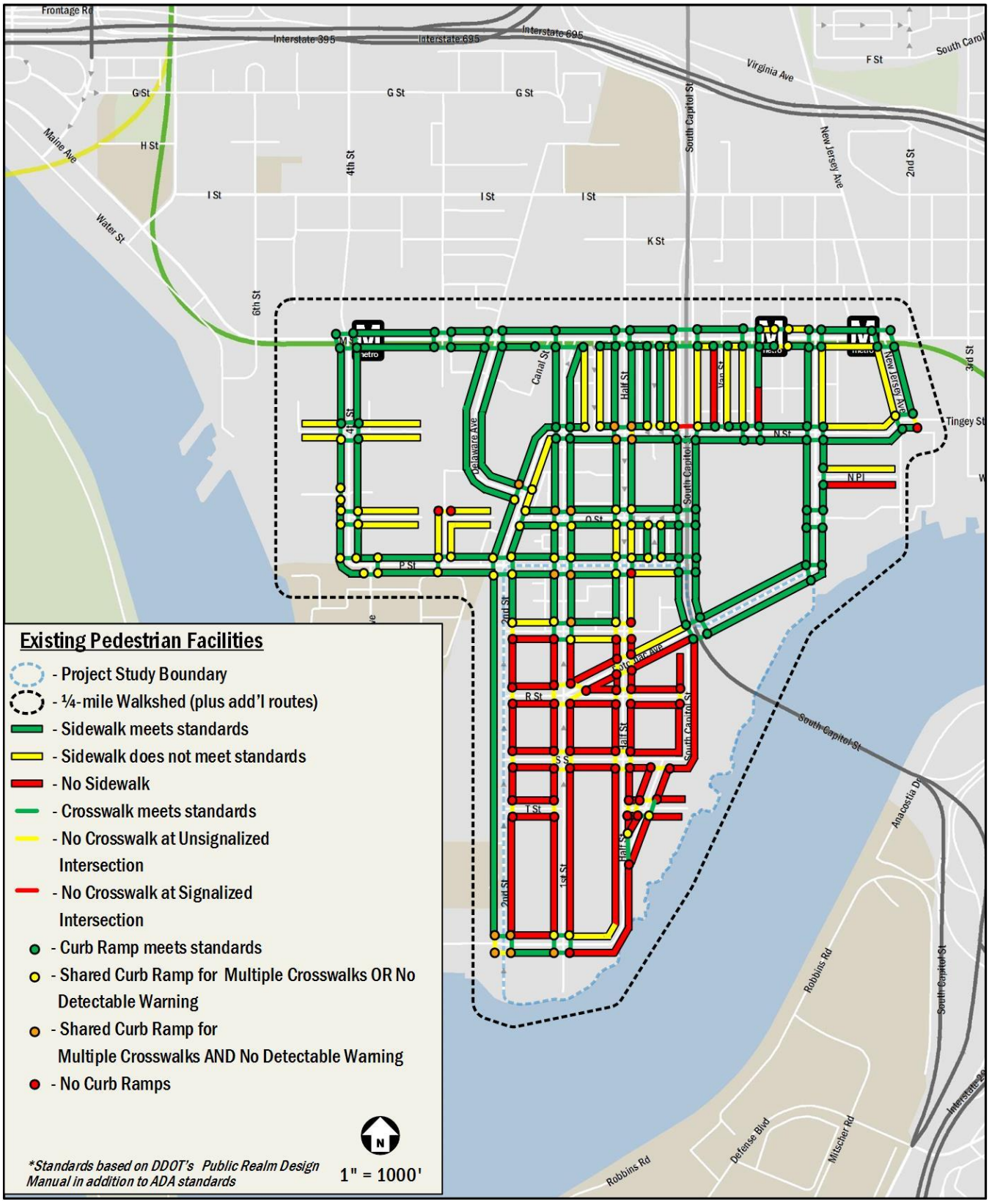

Figure 6: Pedestrian Infrastructure

2035 Future Conditions

The Buzzard Point neighborhood is expected to undergo significant changes over the next 20 years, as outlined in the Buzzard Point Framework Plan. The neighborhood is currently dominated by industrial uses and surface parking lots which offer an opportunity for redevelopment. This analysis gives recommendations for the overall transportation network within this neighborhood as a result of major transportation projects and developments.

Major Transportation Projects and Developments

The projects and developments expected to significantly impact the Buzzard Point neighborhood can be broken down into the following four categories:

- *South Capitol Street Environmental Impact Statement (EIS)*
  The purpose of the South Capitol Street project is to improve safety, mobility, and accessibility and to support economic development in the vicinity of the project. The project will: (1) correct the design and deteriorating condition of the transportation infrastructure which creates safety concerns for vehicular, pedestrian, and bicycle traffic and transit riders; (2) construct missing critical regional roadway connections of vehicles, pedestrian, and bicycles; (3) correct mobility barriers that limit access to activity centers in the study area; and (4) support economic growth in order to improve the density of employment and residential development.

  In the vicinity of Buzzard Point the Preferred Alternative from the Final EIS includes construction of a traffic oval to connect South Capitol Street, Potomac Avenue, R Street, and Q Street. The full EIS can be found at the following link: http://southcapitoleis.com/documents/

- *Buzzard Point Stadium*
  DC United is proposing to relocate their Stadium to the Buzzard Point neighborhood, generally bounded by R Street/Potomac Avenue to the north, T Street to the south, 2nd Street to the west, and 1st Street/Half Street to the east. This project is expected to act as a catalyst for further redevelopment in the Buzzard Point neighborhood.

- *Streetcar Service*
  The District Department of Transportation (DDOT) is conducting a planning study to examine opportunities for a streetcar connection along the North-South corridor between Takoma/Silver Spring area to the Buzzard Point/Southwest area. The study has developed four route alternatives, which use Half Street and/or 2nd Street. Additionally, a streetcar connection between the Anacostia/South Capitol area and the Buzzard Point/Southwest area is proposed as part of the 22-mile Priority Streetcar Network. This line will presumably have the same alignment within Buzzard Point as the North-South corridor line.

- *General Redevelopment*
  Expected redevelopment within the Buzzard Point neighborhood has been projected as stated in the *Buzzard Point Framework Plan*. Trips generated by these developments will help form the basic framework of roadways, lane configurations, traffic operations, and multi-modal needs within the neighborhood. The projected trip generation of the Buzzard Point redevelopment is discussed in the following section.

Buzzard Point Vision Framework Trip Generation

The first step in reviewing the impacts of the potential development outlined in the Framework Plan was to determine the new transportation demand the development would generate. This was accomplished by taking the potential development program provided in the Framework Plan, which was presented in square footage of residential and commercial space, and converting it to variables used in transportation demand models. For residential this variable used is dwelling units, and this analysis used the same assumption the Framework Plan did, which was 1,098 square feet per dwelling unit. For the commercial space, this analysis assumed a 90/10 split between office and retail use. In addition to these variables, the total number of residents and employees was calculated to provide a comparison with prior transportation studies performed by DDOT. The assumptions used to convert residential and commercial variables to residents and employees were based on those contained in the *M Street SE/SW Waterfront Transportation Planning Study*, which were originally provided by the DC Office of Planning. Table 4 provides a summary of the development assumptions by Square and Figure 7 shows a map of the corresponding Square locations within Buzzard Point and their assumed access schemes.

Of note, the existing uses and demand within the study area are not incorporated into this analysis. The Framework Plan assumes each existing building redeveloped as part of its calculations of potential future development on Buzzard Point. As such, this analysis is only based on the potential development presented in Table 4, and not a combination of existing buildings and planned future development.

The development potential contained in the Buzzard Point Framework Plan exceeds what has previously been assumed in prior DDOT studies. The *M Street SE/SW Waterfront Transportation Planning Study*, and studies related to the South

Table 4: Summary of Development Assumptions

Square #	Residential Units	Office Space (SF)	Retail Space (SF)	Residents	Employees
656	270	144,600	16,100	577	547
657	641	343,000	38,100	1,371	1,297
658	319	170,700	19,000	682	646
660	177	94,700	10,500	378	358
661	634	339,300	37,700	1356	1283
662 & 662E	604	323,600	36,000	1,292	1,224
708S	181	85,000	9,400	387	321
664	226	120,900	13,400	483	457
664E	132	82,700	9,200	282	313
610	403	216,000	24,000	862	817
612	210	131,400	14,600	449	497
609 & 611	1,593	972,000	108,000	3,406	3,676
613	291	266,400	29,600	622	1008
666	178	266,500	29,600	381	1,008
667S	64	42,300	4,700	137	160
Total	**5,923**	**3,599,100**	**399,900**	**12,665**	**13,612**

Table 5: Summary of Resident/Employee Estimates

Source of Population Estimates	Residents	Employees
Buzzard Point Framework Potential	12,665	13,612
Assumptions for TAZ 192 from M St SE/SW Study (Year 2035)	380	17,217
Difference	**12,285**	**-3,605**

Capitol Street EIS both used assumptions based on modified versions of the MWCOG Round 8.0 regional model, adjusted based on development plans for Buzzard Point. TAZ 192 in the MWCOG model correlates closely to the study area of this analysis, and as shown on Table 5 the total amount of residents and employment do not line up with the MWCOG-based projections. The main difference is the amount of residential development.

The potential development program was used to develop projections of traffic demand, using standard industry estimates, adjusted for the urban nature of Buzzard Point. The adjustments are in the form of mode split estimates, which reduce the total amount of traffic generated by taking into account the amount of people who will walk, bike or take transit instead of driving. The estimates used in the analysis, based on census data and MWCOG's *State of the Commute* report, are displayed in Table 7:

Table 7: Mode Split Assumptions

Mode	Residential	Retail	Office
Drive	30%	15%	40%
Transit	45%	15%	45%
Bike	5%	10%	5%
Walk	20%	60%	10%

Using the mode split assumptions, the total traffic generated by the future development during the commuter peak hours was calculated. Table 6 shows a summary of the calculations, details are attached to this document.

Table 6: Trip Generation Assumptions

Square	AM Peak Hour			PM Peak Hour		
	In	*Out*	*Total*	*In*	*Out*	*Total*
656	100 veh/hr	46 veh/hr	146 veh/hr	53 veh/hr	102 veh/hr	155 veh/hr
657	19 veh/hr	76 veh/hr	95 veh/hr	72 veh/hr	39 veh/hr	111 veh/hr
658	115 veh/hr	53 veh/hr	168 veh/hr	61 veh/hr	115 veh/hr	176 veh/hr
660	71 veh/hr	31 veh/hr	102 veh/hr	38 veh/hr	77 veh/hr	114 veh/hr
661	201 veh/hr	102 veh/hr	303 veh/hr	113 veh/hr	201 veh/hr	314 veh/hr
662	194 veh/hr	98 veh/hr	291 veh/hr	108 veh/hr	194 veh/hr	302 veh/hr
708S	66 veh/hr	31 veh/hr	96 veh/hr	37 veh/hr	73 veh/hr	110 veh/hr
664	87 veh/hr	39 veh/hr	125 veh/hr	46 veh/hr	90 veh/hr	136 veh/hr
664E	63 veh/hr	25 veh/hr	87 veh/hr	32 veh/hr	69 veh/hr	101 veh/hr
610	139 veh/hr	66 veh/hr	205 veh/hr	75 veh/hr	139 veh/hr	213 veh/hr
612	91 veh/hr	38 veh/hr	129 veh/hr	45 veh/hr	94 veh/hr	138 veh/hr
609 & 611	472 veh/hr	251 veh/hr	723 veh/hr	282 veh/hr	513 veh/hr	795 veh/hr
613	159 veh/hr	57 veh/hr	216 veh/hr	68 veh/hr	152 veh/hr	221 veh/hr
666	156 veh/hr	44 veh/hr	199 veh/hr	56 veh/hr	146 veh/hr	202 veh/hr
667S	36 veh/hr	14 veh/hr	50 veh/hr	20 veh/hr	49 veh/hr	69 veh/hr
Total	**1967 veh/hr**	**969 veh/hr**	**2936 veh/hr**	**1105 veh/hr**	**2051 veh/hr**	**3156 veh/hr**

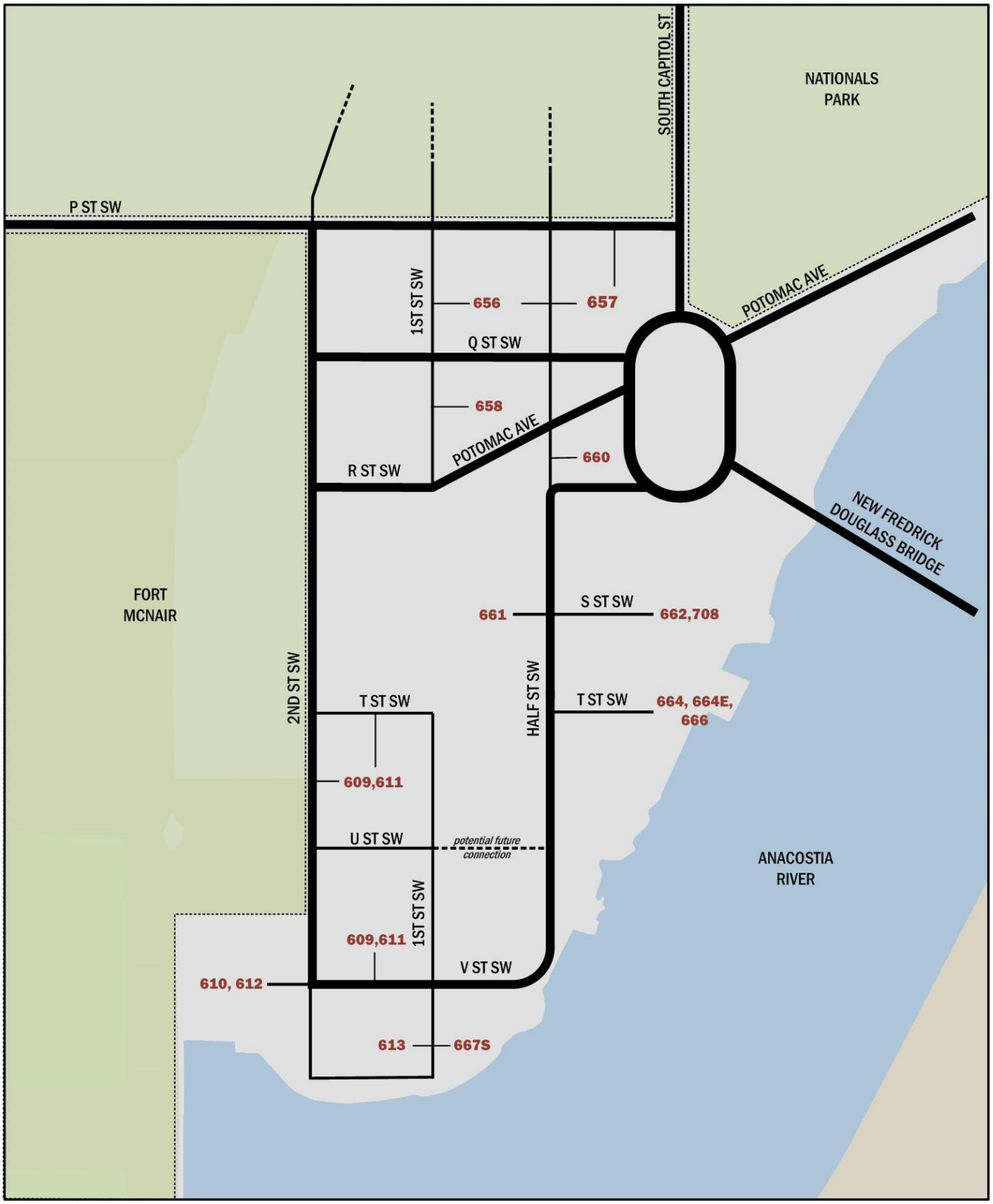

Figure 7: Square Locations and Access Schemes

Roadway Circulation Alternatives

A general roadway circulation plan for Buzzard Point was developed in the *Buzzard Point Framework Plan* based on the footprints of planned developments and their projected access locations. The circulation plan aims to build off the South Capitol Street Corridor improvements while creating a primary loop of two-way streets around Buzzard Point with additional secondary vehicular connections where viable in order to disperse traffic throughout a local streets network. A schematic of this circulation plan, labeled *Option 1: Two-Way Traffic on 2nd and Half Streets*, is shown in Figure 8.

As part of this analysis, Gorove/Slade developed an alternative plan that creates a counter-clockwise one-way loop. The thought behind this plan is that it could reduce the number of conflicting turning movements throughout the neighborhood while maintaining full access to the South Capitol Street oval. This type of plan has the potential for operational and safety benefits, although the one-way loop could increase trip lengths via circuitous routing. This plan, labeled *Option 2: One-Way Traffic on 2nd and Half Streets*, is also shown in Figure 8.

Transportation Operations

This section provides a summary of an analysis of the overall transportation operations in the Buzzard Point neighborhood. This analysis first determines the vehicular capacity needs along the proposed street network, and then based on these results, arranges pedestrian, bicycle, and transit infrastructure within the remaining roadway right-of-way to create a network that best serves the needs of all modes of transportation.

This analysis was based on the PM peak hour of traffic. The PM peak has a higher overall trip generation with a much higher proportion of outbound traffic. Outbound traffic will be more difficult to accommodate due to the configuration of the South Capitol Street oval, therefore the scenario with more outbound traffic provides a better basis for recommendations. Additionally, DDOT provided signal timings for the South Capitol Street oval for the PM peak hour, allowing this study to build upon prior ones.

Traffic Volume Assumptions

Base PM peak hour traffic volumes for 2035 were estimated along P Street and South Capitol Street based on existing traffic counts performed by Gorove/Slade for the transportation elements of the *Buzzard Point Soccer Stadium Environmental Mitigation Study* and the Synchro files from the *M Street Southeast-Southwest Special Events Study Final Report* performed in May of 2014. As stated previously, existing volumes on the local roads within Buzzard Point will not be included in the analysis. Under the Framework Plan, all existing buildings generating significant amounts of traffic are included as redevelopment parcels and thus are accommodated for in the redevelopment trip generation.

Lane Configuration & Operational Assumptions

Signal timings and lane configurations for the South Capitol Street oval were provided by DDOT and were not altered as part of this analysis. These plans were joined with the proposed Buzzard Point circulation plans to create a general roadway network of the neighborhood. For the initial analysis, all intersections outside of the South Capitol Street oval were assumed to be stop-controlled until a signal was warranted by either vehicular or pedestrian volumes. The results of the subsequent analyses and refined lane configurations are discussed later in this report.

Trip Assignment

Trip distribution and assignment for the Buzzard Point neighborhood was based on census data for nearby residential and office land uses, as well as expected travel patterns to and from the neighborhood, keeping in mind turning restrictions surrounding the residential neighborhood to the north. The distribution used for redevelopment sites is shown in Table 8.

Table 8: Trip Distribution Assumptions

Direction of Approach	Percentage
South Capitol Street (to/from the South)	40%
South Capitol Street (to/from the North)	40%
M Street SW (to/from the West)	20%

Of note, trips traveling to and from M Street SW were expected to enter and exit the Buzzard Point neighborhood via 4th Street and P Street SW. Trips traveling to and from the north via South Capitol Street were primarily expected to use the South Capitol Street oval; however, some trips generated by the redevelopment sites, particularly those north of R Street were routed to the intersection of South Capitol Street and O Street and very minimally through the neighborhood to the north. Thus, the South Capitol Street oval will process the cast majority of Buzzard Point traffic in the future, becoming the vehicular 'front door' for the neighborhood.

At this stage in the analysis**, the second circulation plan, Option 2, with a one-way loop configuration was eliminated** for the following reasons:

- Inbound trips to developments within Squares 661, 662, 708, 664, 664E, and 666 would become cumbersome due to forced routing around Buzzard Point instead of more direct access.
- Although a reduction in conflicts occurred at some intersections, the increase in overall traffic along 2nd Street, U Street, and Half Street was deemed too high to outweigh the positive impacts. The higher traffic along these roadways has the potential to decrease the amount of right-of-way designated towards non-auto modes of transportation.
- More stress was observed along P Street as outbound trips to M Street SW were concentrated along Half Street as opposed to being more evenly distributed along Half Street and 2nd Street.

For these reasons, it became clear that the Framework Plan's recommendation of a two-way street network was preferable than a one-way network, and the one-way network was eliminated from further analysis. As such, Figures 9 through 13, which depict volumes, lane configurations, and capacity analysis results are only presented for Option 1. This is because the methodology in this report set lane configurations based on the minimum necessary roadway needs to achieve acceptable capacity results. As the analysis progressed, it was not possible to create feasible lane configurations for Option 2 to achieve acceptable results, for the reasons stated above.

Although Option 1 was selected for analysis, this report notes that the eventual development phasing, site access points, and land uses per parcel all may differ from the assumptions made in this analysis. Thus, minor changes in street directionality (for short distances), may be acceptable even with Option 1, depending on the exact details at the time of redevelopment.

The study area was based on the intersections expected to observe the greatest impact from the Buzzard Point redevelopment are as follows:

1. P Street & 2nd Street, SW
2. P Street & First Street, SW
3. P Street & Half Street, W
4. P Street & South Capitol Street
5. Q Street & 2nd Street, SW
6. Q Street & First Street, SW
7. Q Street & Half Street, SW
8. Q Street & South Capitol Street
9. South Capitol Street at Oval Access
10. R Street & 2nd Street, SW
11. R Street/Potomac Avenue & First Street, SW
12. Potomac Avenue & Half Street, SW
13. Potomac Avenue & South Capitol Street SB
14. R Street & Half Street, SW
15. R Street & South Capitol Street SB
16. S Street & Half Street, SW
17. T Street & 2nd Street, SW
18. T Street & Half Street, SW
19. U Street & 2nd Street, SW
20. U Street & Half Street, SW
21. V Street & 2nd Street, SW
22. V Street & First Street, SW

PM peak hour volumes for the first circulation plan, based on the above trip distribution and assignment are shown in Figure 9 and Figure 10 for the study area.

Analysis Methodology & Capacity Analysis Results

Based on the projected 2035 volumes and the *Highway Capacity* Manual (HCM) analysis methodology, intersection lane configurations and traffic operations were determined for the study area such that all intersections operate at an acceptable LOS. The exception to this is some intersections directly along the South Capitol Street oval. Lane configurations and traffic operations at these intersections were not altered from those shown in the Synchro files provided by DDOT.

The subsequent lane configurations and traffic control at the study area intersections are shown in Figure 11 and Figure 12. The resulting LOS results are shown in Figure 13 and Figure 14. Based on the proposed lane configurations within Buzzard Point to accommodate vehicular traffic, multi-modal elements of the streetscape were then determined. The multi-modal elements were added within the remaining roadway right-of-way width to best satisfy the current and future needs of the site. The findings and recommendations for the roadway layout and configuration within the Buzzard Point neighborhood is discussed below.

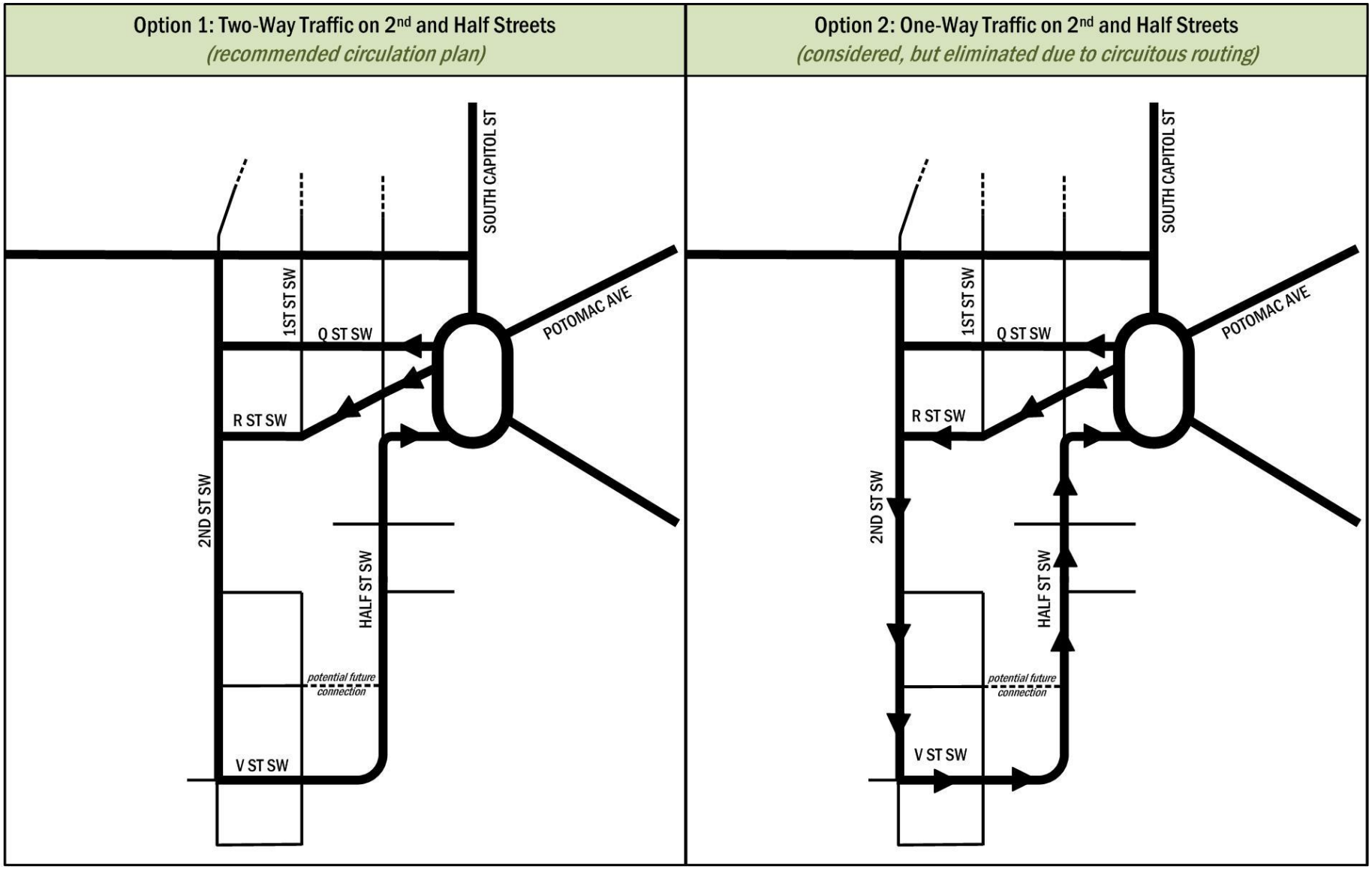

Figure 8: Circulation Plan Alternatives

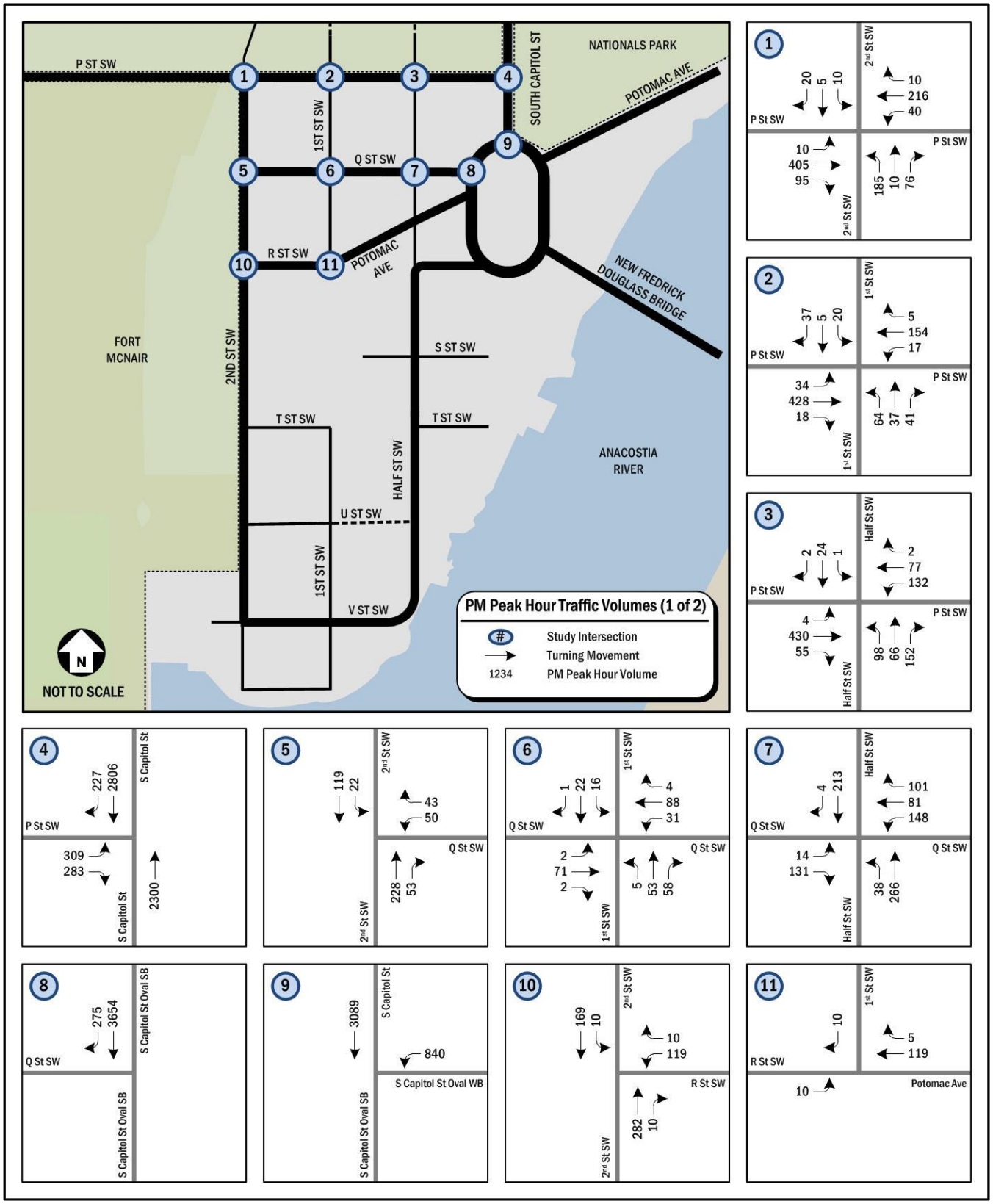

Figure 9: PM Peak Hour Traffic Volumes (1 of 2)

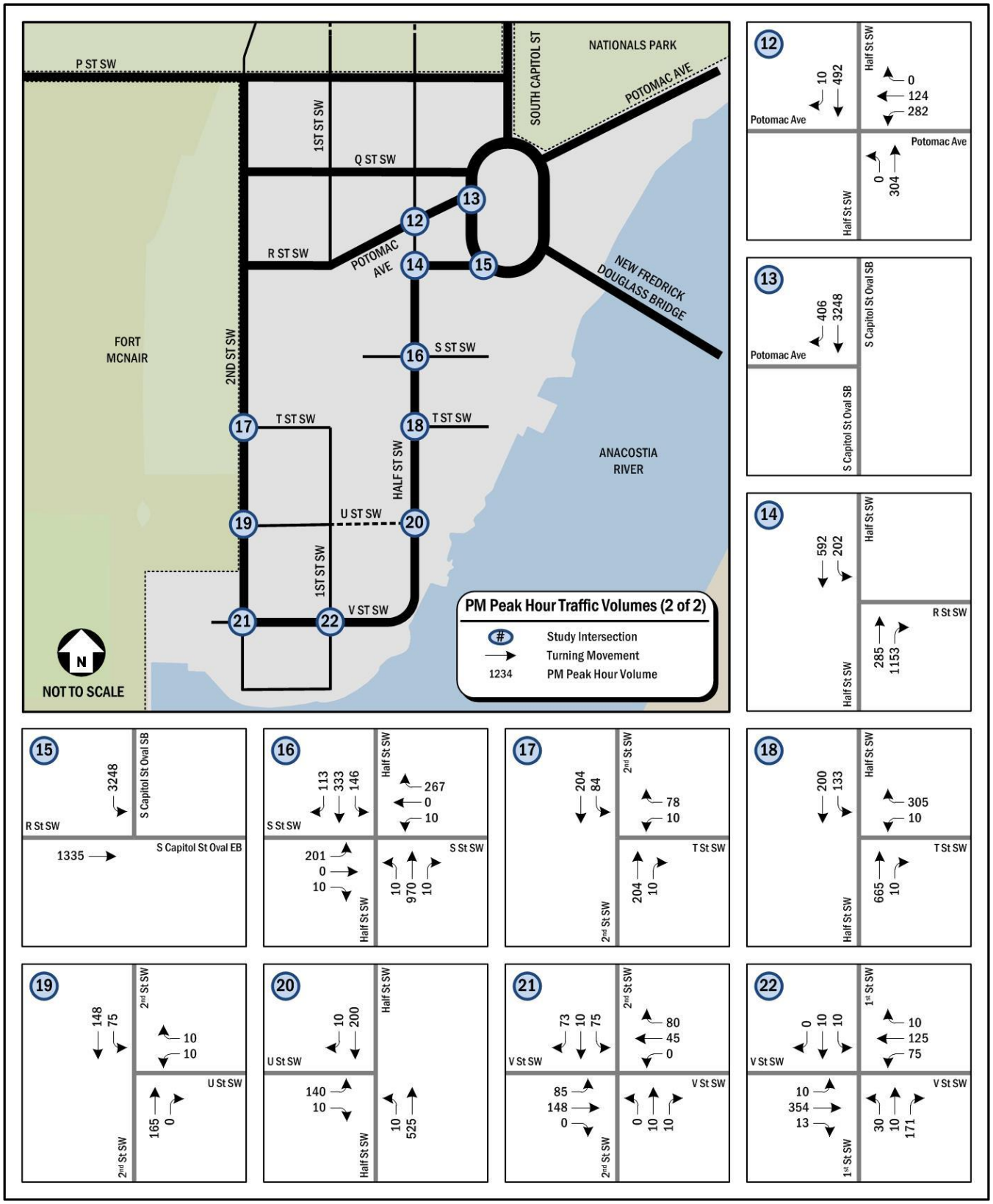

Figure 10: PM Peak Hour Traffic Volumes (2 of 2)

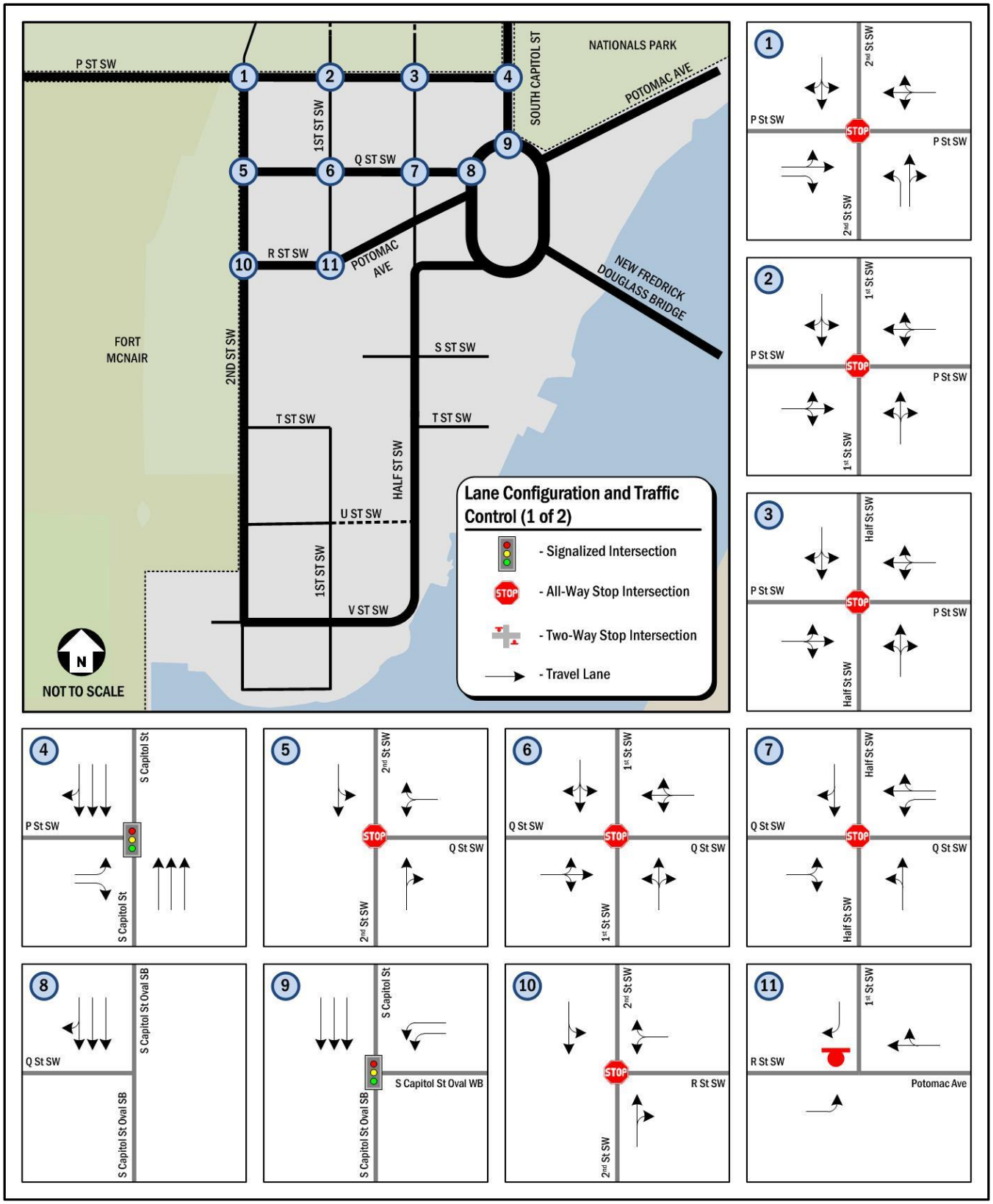

Figure 11: Lane Configuration and Traffic Control (1 of 2)

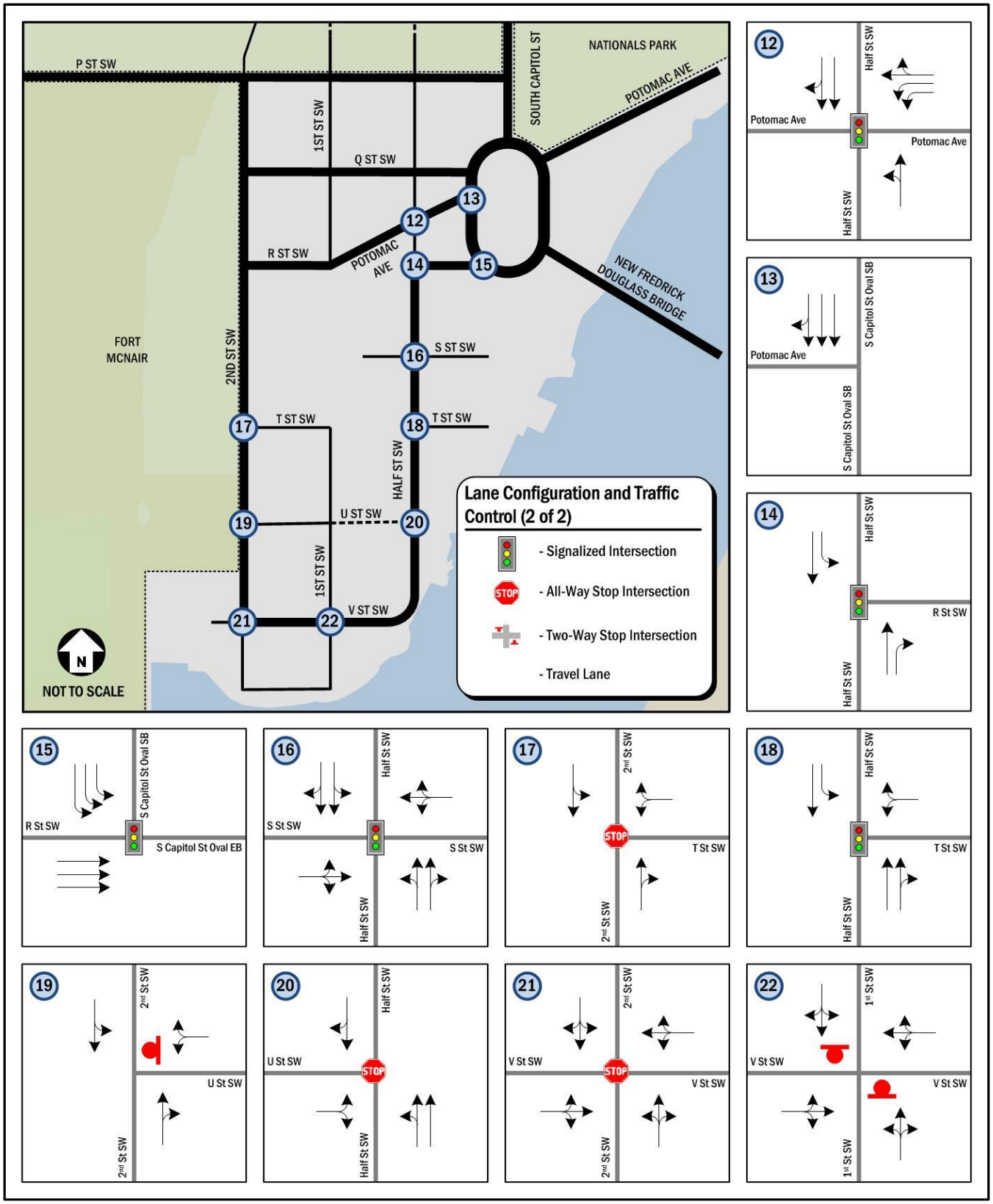

Figure 12: Lane Configuration and Traffic Control (2 of 2)

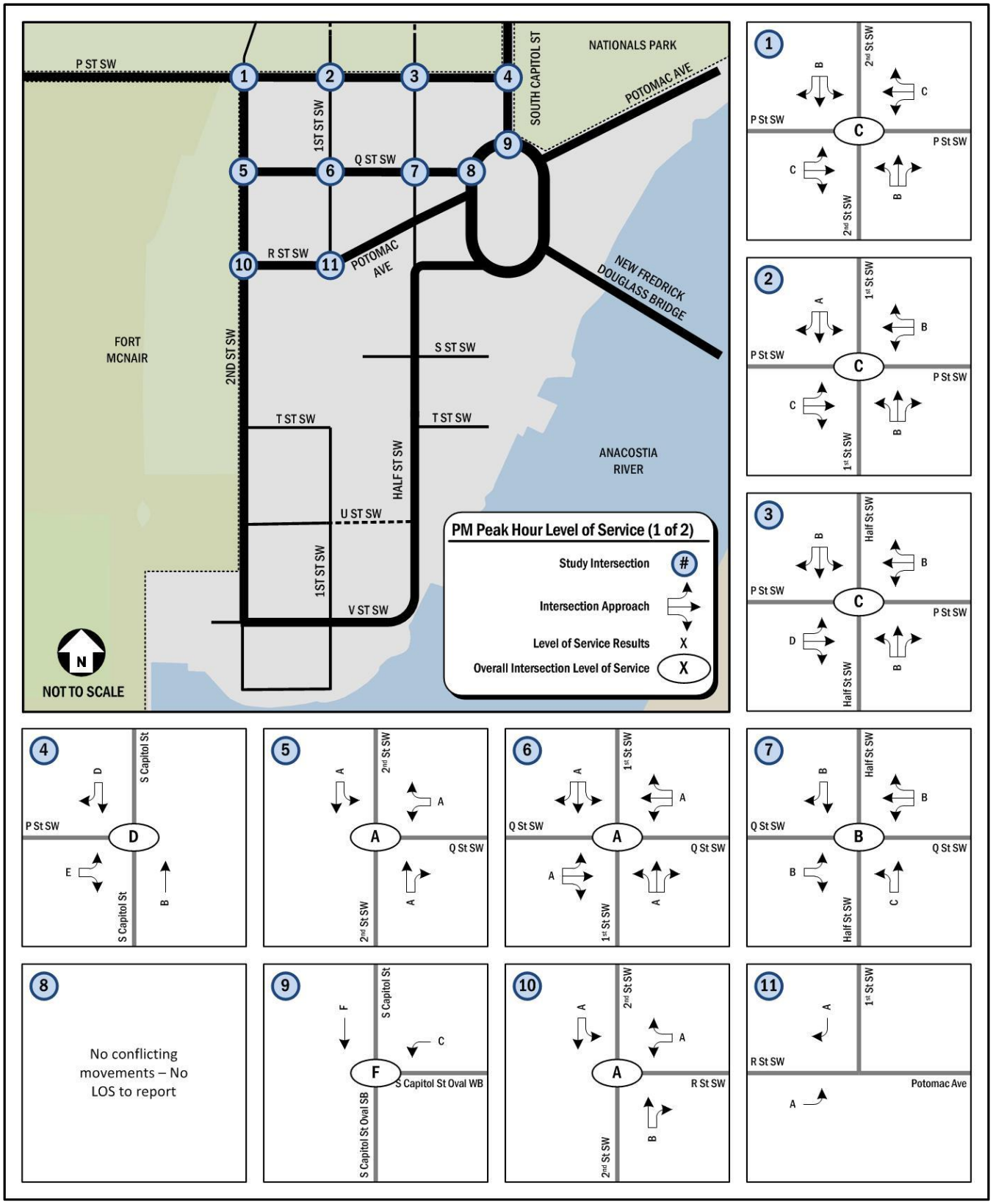

Figure 13: PM Peak Hour Level of Service (1 of 2)

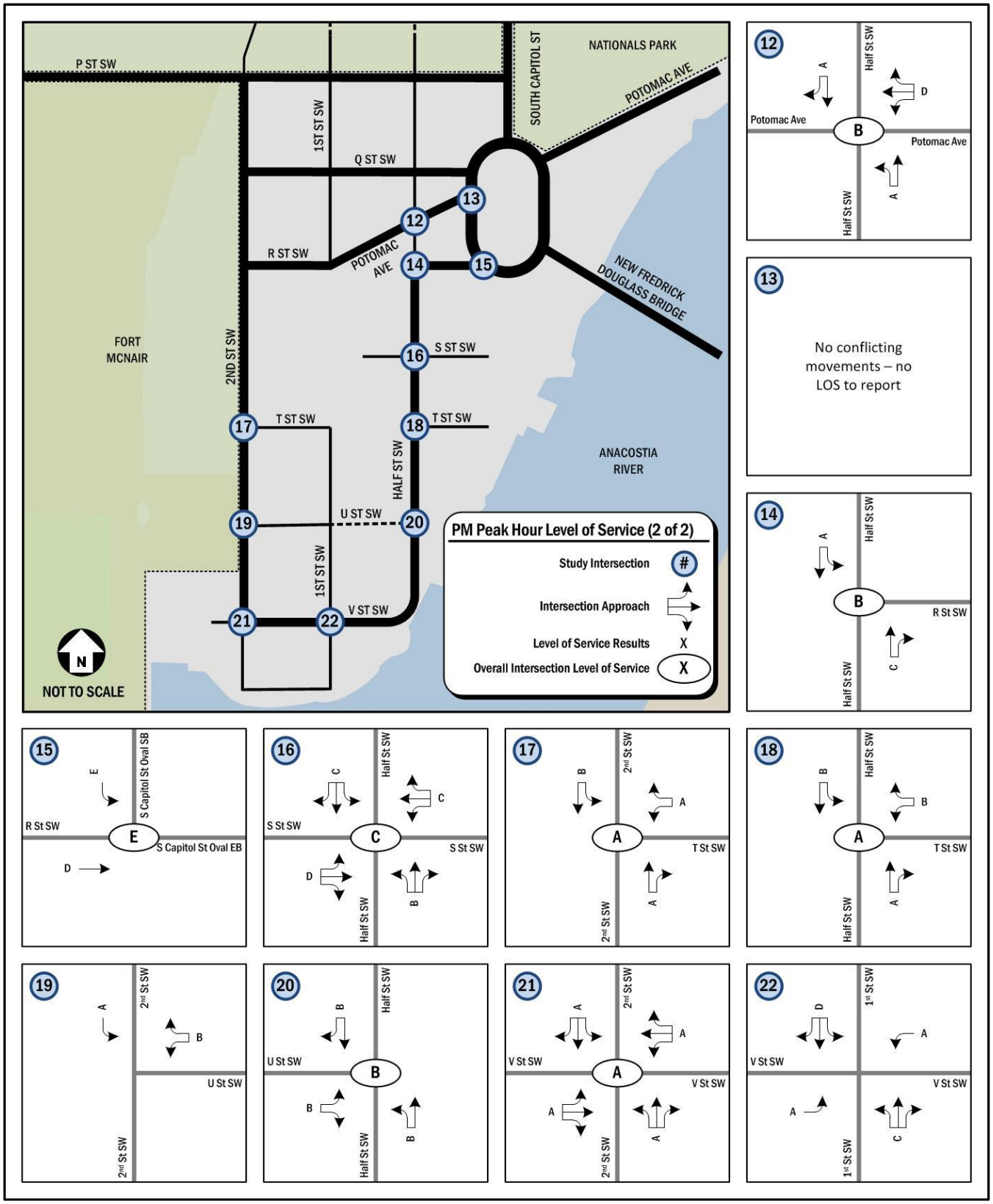

Figure 14: PM Peak Hour Level of Service (2 of 2)

FINDINGS AND RECOMMENDATIONS

The following summarizes the overall transportation findings and recommendations for the Buzzard Point neighborhood. These recommendations are meant to first satisfy the vehicular needs of the site, while allocating remaining roadway right-of-way to multi-modal transportation infrastructure. These recommendations take into account potential streetcar plans and how they would impact vehicular, bicycle, and pedestrian operations; the location of bicycle infrastructure in relation to vehicular traffic and overall connectivity; enhanced pedestrian infrastructure along primary pedestrian routes; and the overall functionality of a cohesive multi-modal transportation system. The focus of this analysis is on curb-to-curb needs, with the specifics on how pedestrian infrastructure will be laid out to be determined when the needs of each site are refined. The findings and recommendations are also represented graphically on Figure 15 and Figure 16.

The following recommendations are intended to be flexible. The eventual development phasing, site access points, and land uses per parcel all may differ from the assumptions made in this analysis. Thus, minor changes that fit within the following recommendations may be needed, such as street directionality (for short distances), traffic signal locations, locations of turn lanes, and other details.

As such, this report recommends that developers of the Buzzard Point parcels coordinate with DDOT at an early stage in the approvals process to ensure that developments are consistent with the Urban Design Framework. Deviations from the Framework Plan, especially regarding site access, may alter the findings of this analysis.

ROADWAY CONFIGURATION AND TRAFFIC CONTROL

- The roadway layout and circulation plan laid out in the *Buzzard Point Framework Plan* generally works well. No changes to directionality are proposed and only minor changes to traffic control are recommended.
- Roadway cross-section recommendations are intended to be flexible and can be broken up into three "roadway types" as follows (and shown on Figure 15):
    - Type A (Half & V Streets): These are 80' (ROW streets with a recommended 40' curb-to-curb width. The usage of the 40' will change depending on the block with the two inside lanes always being one travel lane in each direction, but the outside lanes being either: (1) peak hour restricted parking, (2) permanent on-street parking, or (3) turn lanes. The remaining ROW, 20' on each side, could be allocated for sidewalk, planting strips/tree boxes, café seating or bike lanes.
    - Type B (2nd Street): This is a 90' ROW street, but it appears Fort McNair has built into the ROW by around 10', making it an 80' street for practical purposes. This road only needs one travel lane in each direction to accommodate future development demand. This analysis recommends:
        - If streetcar tracks use Half Street in both-directions: A 44' curb-to-curb width, with two travel lanes and two dedicated streetcar lanes. On the Fort side, it is recommended that 12' be set aside for a cycle track (10' plus 2' buffer), and a small (6') sidewalk. That leaves 18' on the Stadium side for sidewalk/planting.
        - If streetcar tracks are not located on Half Street, or only in one direction: A 38' cross-section should be used to accommodate travel lanes and on-street parking on both sides. In this configuration, streetcars would operate in mixed-travel. On the Fort side, it is recommended that 18' be set aside for a cycle track (10' plus 2' buffer), and a small (6') sidewalk. That leaves 24' on the Stadium side for sidewalk/planting.
    - Type C (all remaining streets): These need just one travel lane in each direction (no turn lanes necessary). The rest of the ROW can be distributed based on the specific needs of the surrounding sites with parking lanes, sidewalks, etc. (with the exception of the bike lane recommendations for Q and V as discussed below). Until specific development plans are known, it may be beneficial to provide on-street parking along these roadways that can be used as additional travel/turn lanes as needed. For example, a curb-to-curb with of 40' can be used for one lane in each direction at 11' wide each, plus an 8' parking lane on each side. Thus, if

future plans differ from those analyzed in this study, or access points change in a manner that more travel lanes are required, the 40' curb to curb width, could provide either two travel lanes at 12' each and two parking lanes at 8' each, or four travel lanes at 10' each.

An 80' to 90' total ROW for these streets is recommended, which would accommodate 20' to 25' on each side of the road for sidewalk, planting strips/tree boxes, café seating or bike lanes. An exception to this is Potomac Avenue, which has a current ROW of 160'. This report recommends maintaining that ROW, even under a 40' curb to curb condition.

- Four new traffic signals are projected based on this analysis. Two locations, Half Street's intersections with Q Street and Potomac Avenue were included as signals in the South Capitol Street EIS. The need for two additional ones, at Half Street's intersections with S and T Streets, depends on the exact location and driveways, access routes, and the development program. There will also likely be a signal on the 2nd Street side if the streetcar is present and needs a switch to turn-around, and to process pedestrian crossings from a stop. Other traffic signals not shown on the plan may be necessary to accommodate pedestrian and bicycle flows and connectivity depending on the final layout of those facilities and desire lines.

- The traffic analysis shows that P Street's approach to South Capitol Street may need to expand to two lanes, one each dedicated to right and left turns. This can be done when the adjacent Square is redeveloped. At the time the curb line can be moved a few feet to the south.

- This analysis did not propose any changes to the proposed South Capitol Street oval design, or the configuration of Potomac Avenue.

Bicycle Facilities

This analysis recommends some modifications to the bicycle network from that proposed in the Buzzard Point Framework Plan, as summarized in Figure 16.

- As mentioned above, a two-way off-street cycle track is recommended along 2nd Street adjacent to the Fort for the following reasons:
  - There will be no vehicles turning over the cycle track because there are limited access points to the Fort along 2nd Street.
  - It places cyclists off the potential streetcar routes, avoiding potential bicycle/track conflicts and operational issues.

- Bike lanes along V Street are recommended since this roadway will act as a connection between the cycle track and the Riverwalk Trail. A connection straight across U Street is also desirable, but that roadway will not be constructed until the adjacent PEPCO building is discontinued and redeveloped.

- Bike lanes on Q Street are recommended to help provide a more direct connection from the new bridge to 2nd Street. The accommodations around the Oval are not ideal for cycling, so there will be a strong desire to cut-through Buzzard Point instead of biking on the sidewalk up to P Street and then heading west. Note that this includes a contra-flow bike lane on the block of Q St adjacent to the Oval.

- A similar recommendation is made for Potomac Avenue and R Streets between the 2nd Street and the traffic oval. The wide ROW of Potomac Avenue can be used to create a high quality two-way facility, providing direct connectivity from the traffic oval towards the Buzzard Point stadium.

- Bike lanes along Half Street should be considered as an additional connection if streetcar tracks are not located on Half Street.

Transit Accommodations

Significant upgrades to transit facilities in Buzzard Point will be necessary with full build out of the plan. The amount of development potential in the Framework Plan presented in Table 4 represents a significant amount of transit demand. Based on the mode split assumptions contained in Table 7, ridership demand at peak hours would be approximately 4,500 persons per hour.

The existing facilities, shown on Figure 2, are not sufficient to serve this demand. Although many parcels within Buzzard Point are within a comfortable walk of Metrorail stations, many parcels are not, and additional surface transit will be needed. This can come in the form of extensions of existing WMATA or DC Circulator routes, new bus routes, or the planned streetcar lines that serve Buzzard Point.

This report recommends a flexible transit plan that adds supply as demand rises. The exact transit needs will not be known until each individual parcel redevelops, adding more demand to the network. The transit plans should include an ongoing evaluation of service and capacity, as these needs will change over time.

Pedestrian Facilities

The pedestrian facilities in Buzzard Point will evolve over time, as each parcel redevelops, eventually improving the deficiencies noted in Figure 6. Notably the South Capitol Street EIS and Buzzard Point stadium projects will improve many pedestrian connections and sidewalks in the study area.

As parcels are redeveloped the pedestrian infrastructure should be reviewed to ensure that all pedestrian desire lines are accommodated. Depending on the order to redevelopment, this may require temporary facilities be installed over parcels yet to be redeveloped.

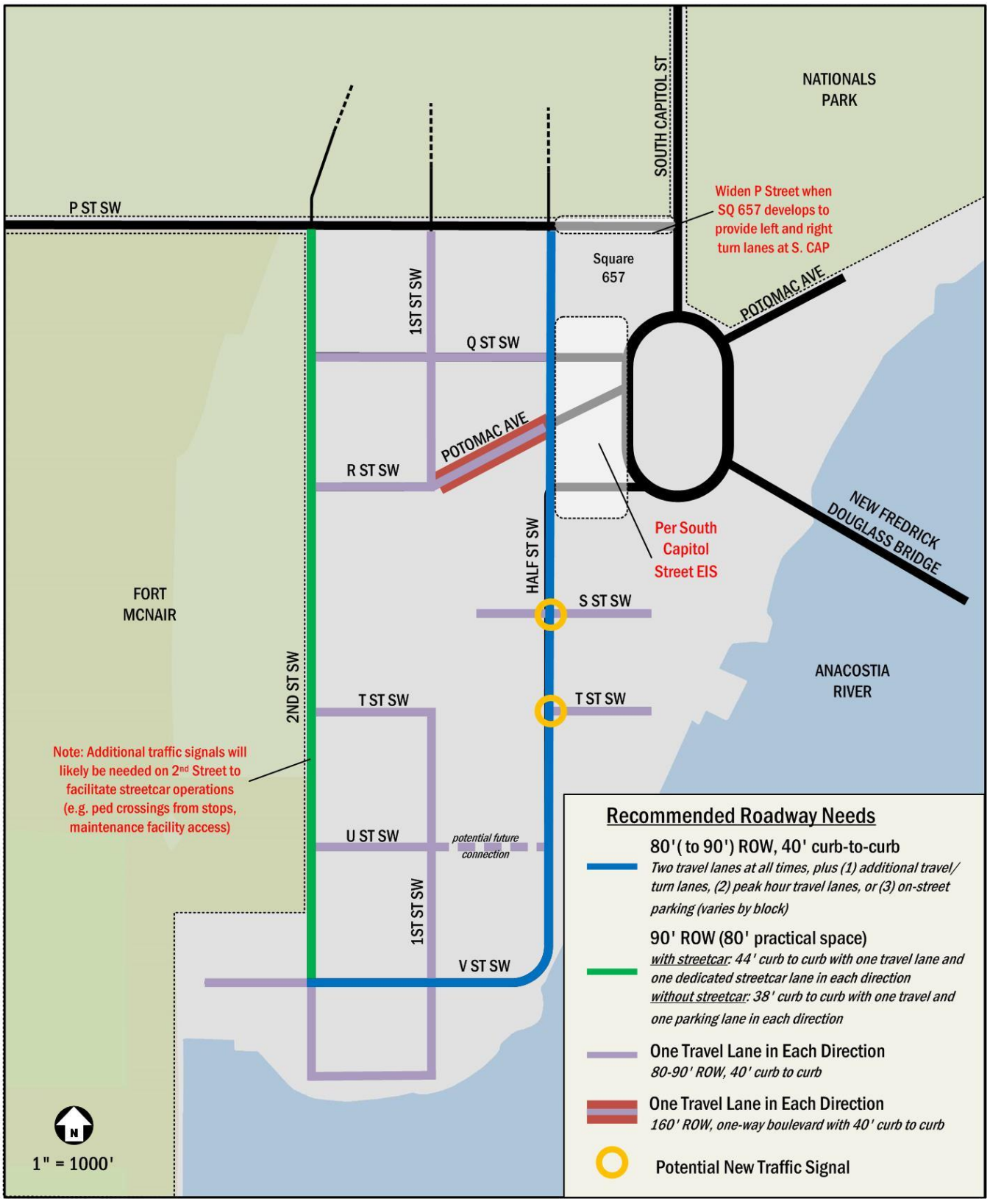

Figure 15: Recommended Roadway Needs

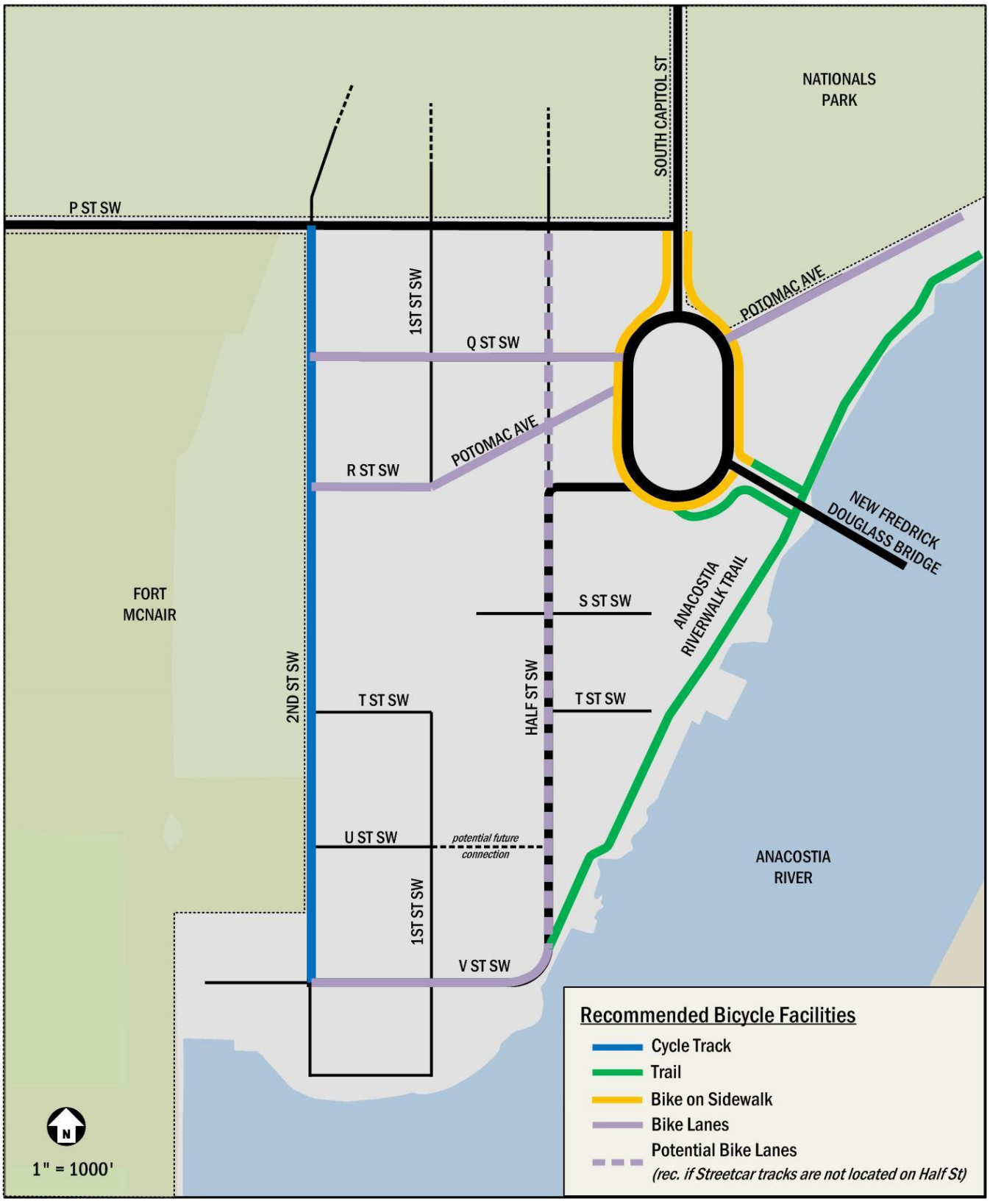

Figure 16: Recommended Bicycle Facilities